

# National Mitigation Investment Strategy

Mitigation Framework Leadership Group

August 2019



Homeland  
Security

## *About the Mitigation Framework Leadership Group*



The Mitigation Framework Leadership Group (MitFLG) is a national coordinating structure authorized by the Post-Katrina Emergency Management Reform Act of 2006. The MitFLG was established to organize mitigation efforts across the Federal Government. Composed of federal, state, local, tribal, and territorial public-sector representatives, the MitFLG integrates federal efforts to deliver the mitigation core capabilities in the National Mitigation Framework and assesses the effectiveness of these capabilities across the United States.

## Executive Summary

The National Mitigation Investment Strategy (“NMIS” or Investment Strategy) is a single national strategy for advancing mitigation investment to reduce risks posed by natural hazards (for example, sea level rise, droughts, floods, hurricanes, tornados, wildfires, earthquakes) and increasing the nation’s resilience to natural hazards. The Investment Strategy’s objective is to identify and measure the effectiveness of mitigation investments, and inform decisions on when and where to make investments. The Investment Strategy encourages the whole community—including individuals—to invest in mitigation, pre- and post-disaster, by adopting the Investment Strategy’s three shared goals. Supporting recommendations focus specifically on how the Federal Government and nonfederal partners can identify, support, influence, and align whole community mitigation investments.

The MitFLG will coordinate the Investment Strategy implementation, carried out by the whole community. The MitFLG will periodically evaluate the success of implementation efforts.

### **GOAL 1:**

#### **Show How Mitigation Investments Reduce Risk**

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The whole community will build a shared understanding of mitigation investment and its value. Specifically, the whole community will understand how effective mitigation investments can protect people, homes, neighborhoods, cultural and historic resources, ecosystems, and lifelines<sup>1</sup> (for example, communications, energy, transportation, and water). The Federal Government and its nonfederal partners will create a shared vocabulary and common measures to communicate information about risk and find opportunities to educate, hire, train, and develop a base of qualified mitigation professionals.

### **GOAL 2:**

#### **Coordinate Mitigation Investments to Reduce Risk**

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The whole community will coordinate mitigation investments through shared risk information, reinforced strategies for risk reduction, and easier access to existing funding. Such coordination will help the whole community justify mitigation investments and choose the most cost-effective and reasonable actions.

### **GOAL 3:**

#### **Make Mitigation Investment Standard Practice**

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The whole community will factor mitigation into investment decisions, especially for buildings and infrastructure. The Federal Government and its nonfederal partners will use and expand financial products and approaches for mitigation investment—including funding, incentives, and financial risk transfer opportunities. The Federal Government and its nonfederal partners also will make mitigation standard professional practice critical to safeguarding lifelines, services, and national safety and security.

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<sup>1</sup> A lifeline enables the continuous operation of critical business and government functions, and it is essential to human health and safety or economic security.

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# Introduction

## The Need for a National Mitigation Investment Strategy

Mitigation helps the whole community keep hazards from turning into disasters. In result, mitigation saves lives. Mitigation activities reduce risks to and impacts on lifelines, buildings, infrastructure, ecosystems, and cultural, historic, and natural resources. Mitigation activities also improve resilience. Mitigation includes the capabilities necessary to reduce loss of life and property by lessening the impact of disasters (See [Scope](#)).

In 2018, hurricanes, tornadoes, flooding and landslides due to heavy rains, and wildfires affected millions of Americans. Such natural hazards resulted in at least 500 deaths and over 1,300 injuries.<sup>2</sup> Natural hazards like these are also very expensive. Since 1980, 246 weather-related disasters in the United States caused at least \$1 billion in damage *each*. Damage from these “billion-dollar disasters” together totaled over \$1.6 trillion.<sup>3</sup>

Mitigation investments include direct investments made to reduce risks posed by hazards to buildings and infrastructure, for example, buying out structures located in a high-risk area, prone to natural hazards. Investments in mitigation improve safety, security, and economic prosperity. For example, society on average saves \$6 for every \$1 spent<sup>4</sup> through federally funded mitigation grants, according to the National Institute of Building Science (NIBS).<sup>5</sup>

The Investment Strategy establishes a vision to save lives and money nationwide by investing in mitigation resources and activities, such as:

- Building and updating structures to the latest codes and standards (for example, building and updating infrastructure to withstand severe storms),
- Collecting and sharing data that identifies risk posed by natural hazards (for example, updated flood maps),
- Aligning funding requirements and incentives for mitigation investment (for example, mitigation grants and loans),

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<sup>2</sup> National Weather Service, *Summary of Natural Hazard Statistics for 2018 in the United States* (April 25, 2018), <https://www.nws.noaa.gov/os/hazstats/sum18.pdf>.

<sup>3</sup> “Billion Dollar Weather and Climate Disasters: Overview,” National Oceanic & Atmospheric Administration (NOAA) National Centers for Environmental Information (July 9, 2018), <https://www.ncdc.noaa.gov/billions/>. This figure does not include the billions of dollars of additional damage caused by less costly weather events.

<sup>4</sup> The discount rate used in the 2017 interim Mitigation Saves report is 2.2%. It is not the same 7% discount rate required by OMB Circular A-94, which would result in a benefit-cost ratio of 4:1. NIBS used the 2.2% discount rate in both studies, partly because it would provide a useful comparison between studies, and partly because the study team felt that it was a more appropriate rate for the type of analyses. While the 2.2% discount rate was used to produce the main benefit-cost ratios for the study, the team also recognized the desire for results using the discount rates required by OMB Circular A-94 (3% and 7%). To that end, all categories of results can be found in a table within the study on page 60 which shows all sub-categories of BCRs at the 2.2%, 3% and 7% discount rates.

<sup>5</sup> NIBS, *Natural Hazard Mitigation Saves: 2017 Interim Report* (December 2017, [https://www.fema.gov/media-library-data/1516812817859-9f866330bd6a1a93f54cdc61088f310a/MS2\\_2017InterimReport.pdf](https://www.fema.gov/media-library-data/1516812817859-9f866330bd6a1a93f54cdc61088f310a/MS2_2017InterimReport.pdf)).



*Figure 1. Examples of Whole Community Roles in Mitigation*

The Investment Strategy responds to a recommendation by the U.S. Government Accountability Office (GAO). In 2015, the GAO reviewed the federal response to Hurricane Sandy. Within its key findings, the GAO found that mitigation investments had not been coordinated, even within the Federal Government. This lack of coordination reduced the effectiveness of investments.

The Investment Strategy complements other Federal Government initiatives for mitigation investment<sup>6</sup> and calls for the Federal Government and nonfederal partners to work together. Partners would identify, prioritize, and implement mitigation investments and would develop proposed recommendations for future investment in mitigation priorities.<sup>7</sup>

<sup>6</sup> For example, the President's National Security Strategy establishes four priority actions to promote American resilience: (1) improve risk management, (2) build a culture of preparedness, (3) improve planning, and (4) incentivize information sharing. *National Security Strategy of the United States of the America* (December 2017), at 14, <https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf>. The recommendations within the National Mitigation Investment Strategy complement these priority actions.

<sup>7</sup> See GAO, *Report to Congressional Requestors: Hurricane Sandy – An Investment Strategy Could Help the Federal Government Enhance National Resilience for Future Disasters*, No. GAO-15-515 (July 2015) (GAO Hurricane Sandy Report), <https://gao.gov/assets/680/671796.pdf>.

## Investment Strategy Overview

**Purpose.** The Investment Strategy’s purpose is to increase the nation’s resilience to natural hazards through more effective, efficient mitigation investment.

The Investment Strategy’s goals are to:

- (1) Show how mitigation investments reduce risk.
- (2) Coordinate mitigation investments to reduce risk.
- (3) Make mitigation investment standard practice.

See [Appendix C](#) for more information on the Investment Strategy’s development.

**Audience.** The Investment Strategy’s national vision is for the whole community. Recommendations on how to identify, support, influence, and align mitigation investments are for the Federal Government and nonfederal partners. Nonfederal partners address a wide range of stakeholders within the Investment Strategy. Initiatives will directly address each unique nonfederal partner stakeholder category during Investment Strategy implementation. Additionally, implementation initiatives will consider the role of individuals and mitigation.

### Audience Definitions

The **Federal Government** includes all federal departments and agencies in the United States.

**Nonfederal partners** include state, local, tribal, and territorial (SLTT) governments and nonfederal organizations: businesses and industries, academic institutions, faith-based organizations, non-governmental organizations, social service and healthcare organizations, and non-profit organizations.

**Individuals** include every person in the United States.

The **whole community** includes the Federal Government, nonfederal partners, and individuals.

**Scope.** Currently, the Investment Strategy focuses on recommendations to mitigate risks posed by natural hazards (for example, sea level rise, droughts, floods, hurricanes, tornadoes, wildfires, and earthquakes). However, recommendations do not exclude implementation efforts that will also mitigate risks posed by man-made hazards.

The Investment Strategy does not propose structural changes to existing federal programs, new federal requirements, or new federal legislation. Implementation actions may address opportunities for improvement to existing programs, however, the Investment Strategy shall not impair or otherwise affect the authority or responsibility granted by law to an executive department, agency, or the head thereof; nor does it create any right or benefit, substantive or procedural, enforceable at law or in equity by a party against the United States, its departments,

agencies, or entities, its officers, employees, or agents, or any other persons. Changes outside of this current scope may be considered later. (See [Next Steps](#).)

Recommendations support mitigation investment decision-making that involves:

- **The whole community.** All goals and recommendations require collaboration and commitment by the Federal Government, nonfederal partners, and individuals.
- **Regional and community planning.** The whole community should consider regional and community planning for mitigation activities. This includes public and private planning efforts for land use, the environment, infrastructure, transportation, site planning, and urban design.
- **Nature-based solutions<sup>8</sup> and natural assets.** The whole community should consider nature-based solutions, such as green infrastructure<sup>9</sup>, for cost-effectively managing the impacts of natural hazards. These solutions may provide additional environmental, social, and economic benefits.<sup>10</sup> The whole community should also consider protecting natural assets that help with mitigation (for example, wetlands that reduce the impact of waves on coastal land).
- **Linking risk reduction and financial risk transfer.** The whole community should better link risk reduction and financial risk transfer mechanisms for natural hazard-related risks. For example, flood and other forms of hazard insurance accelerate recovery timeframes to reduce loss by transferring financial risks from disasters.<sup>11</sup> Additionally, insurance providers can increase incentives for policy holders to physically reduce a policy holder's risks, and reduce overall damages, suffering, and costs from a disaster.
- **Changing conditions.** Population growth, development, and changing weather conditions will influence mitigation needs and priorities.
- **Vulnerable populations.** The whole community should ensure vulnerable populations are represented during implementation of Investment Strategy recommendations.

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<sup>8</sup> Nature-based solutions are sustainable management approaches and practices that use nature and natural systems such as wetlands, vegetated areas, forests, urban trees, green roofs and raingardens to address socio-environmental challenges. Green infrastructure, ecological engineering, ecosystem mitigation and adaptation and integrated water resources management are examples of nature-based solutions.

<sup>9</sup> U.S. Environmental Protection Agency website. 2019. *What is Green Infrastructure?* <https://www.epa.gov/green-infrastructure/what-green-infrastructure>

<sup>10</sup> Naumann, Sandra; Timo Kaphengst; Keighley McFarland and Jutta Stadler. 2014. *Nature-based approaches for climate change mitigation and adaptation. The challenges of climate change - partnering with nature.* German Federal Agency for Nature Conservation (BfN), Ecologic Institute, Bonn. <https://www.ecologic.eu/11240>

<sup>11</sup> CNA Financial Corporation. 2016. *Risk Transfer: A Strategy to Help Protect Your Business.* [https://www.cna.com/web/wcm/connect/b7bacbf0-b432-4e0c-97fa-ce8730b329d5/RC\\_Guide\\_RiskTransferStrategytoHelpProtectYou+Business\\_CNA.pdf?MOD=AJPERES](https://www.cna.com/web/wcm/connect/b7bacbf0-b432-4e0c-97fa-ce8730b329d5/RC_Guide_RiskTransferStrategytoHelpProtectYou+Business_CNA.pdf?MOD=AJPERES)



### Working Together on Wildfire Mitigation

Heavy forests put areas around Mount Adams, Washington, at risk of catastrophic wildfires. Mitigating the risk caused by timber (fuel for forest fires) requires extensive cooperation and planning.

Federal land managers at the Wildlife Refuge, community forest managers from the Mount Adams Resource Stewards Collaboration, landowners, and National Forests and National Parks personnel have been working together to treat timber and induce controlled fires. The multi-year effort spans over nearly 400 acres.

These mitigation projects are also supplying wood products, increasing local jobs, enhancing forest health and wildlife habitat, and making nearby communities safer from wildfires. Coordinated timber harvests and controlled fires from 2014 through 2017:

- Reduced the risk for catastrophic wildfires and their potential for causing loss of lives and extensive damage;
- Brought in over \$3 million in gross receipts and contracts;
- Created approximately 68 months of full-time equivalent positions;
- Paid \$26,000 in timber excise taxes; and
- Contributed to roughly \$8 million in economic expansion.<sup>12</sup>

## Goals and Recommendations

### Goal 1: Show How Mitigation Investments Reduce Risk

Goal 1 encourages a common understanding of how mitigation investments reduce risks to people, homes, neighborhoods, cultural and historic resources, ecosystems, and lifelines (for example, communications, energy, transportation, and water). To achieve this goal, the whole community should use a shared vocabulary to communicate risks and show how mitigation reduces these risks. The Federal Government and nonfederal partners should use education, training, and professional development to increase mitigation investment and build a growing base of qualified mitigation-informed practitioners.

#### Recommendation 1.1 – Make Mitigation Investment Relevant

Over the past several decades, mitigation investments have saved lives and reduced damage to property, buildings, and infrastructure. Yet despite strong evidence, not everyone sees the value of mitigation investment. The whole community—including people with access and functional needs—should establish a fundamental understanding of the wide-ranging benefits of mitigation.

<sup>12</sup> Information provided by U.S. Fish and Wildlife: Frank Conner, Prescribed Fire Specialist and Josh O'Connor, Regional Fire Management Coordinator (Pacific Northwest Region).

**Encourage investment by connecting mitigation to specific priorities.** Mitigation investment involves business owners, community officials, homeowners, and others. Many are motivated by emotions and personal, family, or cultural values rather than financial or engineering data. The Federal Government and nonfederal partners should communicate the value of mitigation through using information people can relate to in a personal way.

**Emphasize the benefits of investment.** The Federal Government and nonfederal partners should use specific, personal examples of mitigation investments. They should talk about economic, social, and environmental benefits. For example, mitigation investment:

- Reduce the risk of injury and loss of life;
- Makes homes and neighborhoods safer;
- Strengthens lifelines (for example, energy; food, water, and shelter; health and medical; safety and security; communications; transportation; and hazardous materials);
- Protects jobs and personal finances;
- Provides economic benefits;
- Reduces suffering after a disaster; and
- Lessens damage to local parks, recreational facilities, and other cultural resources.

**Link local risks to mitigation opportunities.** Linking local risks to mitigation opportunities helps the whole community see connections and encourages mitigation investment. For example, as a mitigation opportunity, the local government could encourage small businesses in a community prone to flooding to use landscaping elements that slow, collect, infiltrate, and filter runoff water.

**Use a common vocabulary.** Words related to mitigation investment are often technical and unfamiliar to people outside of certain professions (for example, emergency management, engineering, floodplain management, and insurance). The Federal Government and nonfederal partners should use language everyone can understand.

A shared vocabulary increases the whole community's understanding of mitigation methods and goals. The Federal Government and nonfederal partners should identify straightforward definitions for risk, mitigation, and resilience. Additionally, the Federal Government and nonfederal partners can write materials for people who are not frequently exposed to regulatory and technical guidance.

## Protecting What Matters

Local leadership can highlight mitigation strategies that protect specific areas most relevant to communities, such as historic and cultural districts and landmarks. This recently occurred in the coastal city of Annapolis, Maryland, an area subject to flooding, hurricanes, tornadoes, thunderstorms, and high wind events.

Many of the buildings and monuments in Annapolis are important to our nation's history and are the lifeblood of the tourism industry in the area. However, in recent years, Annapolis has been subject to increased flooding and damage from storms. Due to sea level rise, the potential for significant flooding due to a hurricane or tropical storm is forecasted to increase with time, threatening historic, downtown buildings.

Annapolis' Office of Historic Preservation received a \$10,000 grant from the National League of Cities' Leadership in Community Resilience Program. With this grant, the city worked closely with the community on a Cultural Resource Hazard Mitigation Plan to address the goal of mitigating damage from rising sea levels, especially damage to cultural resources subject to flooding. The plan ties mitigation investment to community values and helps Annapolis residents and city leaders identify specific actions to adapt to rising water.

## Recommendation 1.2 – Increase Mitigation Investment by Building the Capacity of Communities to Address Their Risks

Communities need to be able to make informed decisions about risk and mitigation investment. This requires education and training, professional networks committed to mitigation, and a pool of skilled professionals.

**Improve access to education and training.** A variety of education and training materials and resources already exist. However, they can be difficult to find and use.

The Federal Government and nonfederal partners should create a more accessible inventory of available resources for mitigation-related training and education. There should be resources for people who work outside of the Federal Government. These resources should include “train-the-trainer” materials to expand reach and impact. The Federal Government should work with nonfederal partners to make sure resources for the whole community reflect emerging needs and changing demands.

**Create professional networks committed to mitigation.** Professional networks encourage collaboration and information-sharing across government and sectors. Professional networks also connect academics, policymakers, and professionals in common goals and strategies. Professional networks give organizations with different interests a way to talk about shared concerns and find opportunities to work together.

**Develop a pool of skilled mitigation professionals.** The Federal Government and nonfederal partners need to work together to develop, train, and hire the next generation of mitigation professionals. To make informed mitigation investments, communities, businesses, and homeowners need people who know how to organize resources, assess and raise awareness of

risks, and find solutions. Because of the interdisciplinary nature of mitigation, developing this pool of skilled mitigation professionals requires building mitigation into many professions (for example, planning, engineering/architecture, economics, and communications professions).

### **Building Resilience Through Sharing Information**

100 Resilient Cities was created by the Rockefeller Foundation and ran from 2013 to 2019. The private organization helped cities around the world deal with the physical, social, and economic challenges of daily stresses and shocks, such as natural hazards. Increased resilience elevates the whole community's threshold if a natural hazard leads to a disaster. (See [Recommendation 2.1](#)) Participants joined a global network of member cities. They received expert guidance for establishing a "Chief Resilience Officer" and developing a robust resilience strategy. Participants were also connected to service providers, partners, and solutions for putting their resilience strategies to work.<sup>13</sup>

### **Recommendation 1.3 – Use Common Measures to Aid Decision-Making for Mitigation Investment**

Communities want information to help identify the most cost-effective way to improve resilience to natural hazards, and to create an understanding of how to make the best use of funding for mitigation projects. Common measures help answer these and many other questions. Common measures include the metrics, indices, and other tools behind risk ratings for infrastructure and buildings, community bond ratings, and more. Common measures help organizations compare opportunities, justify investments, and measure success.

In mitigation, there are measures that help define and quantify how mitigation improves resilience. Mitigation criteria and performance measurement tools help determine if and to what extent mitigation efforts succeed. By developing and applying these criteria and tools, communities may enhance quality of life, overall health, and public safety.

Commonly accepted mitigation metrics will help project managers, policy makers, and elected officials make decisions for mitigation projects (See [Recommendation 2.1](#)).<sup>14</sup> However, the Federal Government and nonfederal partners do not always consistently share or use mitigation measures.<sup>15</sup> To improve this situation, the Federal Government and nonfederal partners can:

**Pilot new tools and refine existing ones.** To demonstrate the value of carrying out mitigation projects, the Federal Government and nonfederal partners should pilot new common measures and tools and refine existing ones.

<sup>13</sup> Rockefeller Foundation. 100 Resilient Cities website (2019), <http://www.100resilientcities.org/>.

<sup>14</sup> Common measures and metrics should consider existing, evolving research, and the whole community should recognize that common measures are subject to change over time.

<sup>15</sup> FEMA. Community Resilience Indicators and National-Level Measures (2019), <https://www.fema.gov/community-resilience-indicators>.

*EnergyStar* and *WaterSense* are examples of common non-mitigation measures that indicate value to the consumer. They are certifications used in the commercial sector to identify products that conserve resources and save money without sacrificing functionality. These certifications provide users with a common measurement methodology to compare products.<sup>16</sup> Likewise, the Federal Government and nonfederal partners should develop commonly accepted measures and tools that show the value of mitigation in a user-friendly way. These common measures will help project managers, policy makers, and elected officials during decision-making for mitigation projects (See [Recommendation 2.1](#)).

**Leverage public-private partnerships.** When identifying and developing common measures, the Federal Government and nonfederal partners should consider leveraging public-private partnerships. Public-private partnerships bring in diverse perspectives and increase the likelihood that common measures will capture all aspects of natural hazard risk, mitigation, and resilience.

**Share results.** When able, the Federal Government and nonfederal partners should share results from accurate, effective tools and frameworks. This strengthens mitigation assessment, tracking, reporting, and communication. Sharing results also helps partners build a business case for better resourcing and potentially combining funds for increased mitigation investment.

### Improving Resilience Through Common Building Measures

Several standards with a focus on improving resilience for buildings and structures are available to the whole community. For example, Leadership in Energy and Environmental Design (LEED) is the most widely used rating system for green buildings in the world. It is a framework for creating healthy, energy-efficient, cost-saving green buildings. LEED-certified buildings must meet certain sustainability and efficiency metrics. LEED certification standards also commonly increase resilience.<sup>17</sup>

Building features found in the Álvarez-Díaz & Villalón offices in San Juan, Puerto Rico demonstrates the use of LEED certification standards ability to increase resilience. The building was originally constructed around 100 years ago. It was renovated in 2013 under LEED Platinum certification requirements. A back-up power generator and satellite internet reduce reliance on ground infrastructure. By minimizing energy usage, lighting control systems reduce the load on the generator. Solar-tube lighting allows people to work with natural light. A rainwater cistern delivers running water when municipal systems are down. After Hurricane Maria, the office was one of the few buildings up and running. It served as a community gathering place and temporary command center.<sup>18</sup>

<sup>16</sup> U.S. Environmental Protection Agency. Energy Star (2019), <https://www.energystar.gov> and WaterSense (2019), <https://www.epa.gov/watersense>.

<sup>17</sup> U.S. Green Building Council. What is LEED? (2019), <https://www.usgbc.org/help/what-leed>.

<sup>18</sup> U.S. Green Building Council. Profiles of Resilience: LEED in Practice (March 2018), <https://www.usgbc.org/sites/default/files/profiles-of-resilience.pdf>.

## Goal 2: Coordinate Mitigation Investments to Reduce Risk

Goal 2 encourages information sharing, strategy coordination, and making funding sources easier to access and use. Improved access to risk and risk reduction information will help the Federal Government and nonfederal partners justify mitigation investments and choose the most cost-effective and reasonable actions. Improved coordination will help the whole community more accurately forecast where mitigation can be effective and when to pursue mitigation investments.

### Recommendation 2.1 – Make Risk Information More Available and Easier to Use

Flood maps, building codes, insurance rates, and other forms of risk information help the whole community understand risks. Risk information also guides planning and mitigation investment decisions. The Federal Government is committed to making this information easy to access, but mitigation-related data is limited and decentralized. By identifying, centralizing, and sharing risk information, the Federal Government and nonfederal partners will provide the whole community with a more complete picture of potential mitigation opportunities, and their costs and benefits.

**Make relevant risk information available.** Risk information includes financial, economic, engineering, environmental, land-use planning, health, and other types of information. The first step, which some government agencies have done, is for the Federal Government and nonfederal partners to see if this information is relevant for making decisions on mitigation investments. The Federal Government and nonfederal partners should use relevant risk information to build tools and data sets that identify ways to reduce risk. These tools can include state and local resources because federal data may not be detailed enough to support local decisions.

**Centrally share risk information.** The Federal Government and nonfederal partners should work together to improve how risk information is collected and shared, still maintaining necessary measures and controls for sharing sensitive, proprietary, or secure information. Creating a unified platform that shares consistent risk information across the whole community can help improve risk information sharing. The platform could be a single website or webpage.

With risk information in a centralized hub, nonfederal partners will be able to apply data to local needs and use national data to build a comprehensive picture of risk. Nonfederal partners also will be able to identify risk data for better planning and decision-making and share their own risk information and resources.

**Provide accessible tools.** Where possible, the Federal Government should also use nonfederal mitigation-related risk data and tools for sharing information in an accessible format. As able, the Federal Government and nonfederal partners should also use open source software to make source code freely available to use, redistribute, and modify.

### Recommendation 2.2 – Align Program Requirements and Incentives

Successful mitigation of risk requires shared priorities, consistent approaches, aligned funding, expanded incentives, and coordination between the Federal Government and nonfederal partners.

**Align risk priorities.** Where possible, the Federal Government and nonfederal partners should align strategies and funding opportunities to prioritize risk-based investments—as noted in the Disaster Recovery and Reform Act of 2018 (DRRA). Examples of high-priority areas are lifelines,<sup>19</sup> critical infrastructure, and vulnerable populations. The Federal Government and nonfederal partners should encourage investments in the highest-priority areas to improve long-term risk reduction. The Department of Homeland Security’s Regional Resiliency Assessment Program (RRAP)<sup>20</sup> and the Threat and Hazard Identification and Risk Assessment (THIRA)<sup>21</sup> are two examples of programs using risk-based prioritization.

**Be consistent.** The Federal Government and nonfederal partners should look at risk and resilience in a consistent manner. For example, all post-disaster programs would benefit from having similar requirements for assessing risk and rebuilding for long-term resilience.

Consistency requires:

- Improving public-private sector coordination to encourage mitigation and simplify access to funding;
- Better public-sector coordination across all-levels of government;
- Communicating and sharing an understanding of priorities;
- Encouraging the private sector to consider long-term risk reduction when investing in facilities and infrastructure; and
- Where appropriate, incentives from the Federal Government and nonfederal partners (including the insurance industry) that align with other initiatives and lead to greater mitigation investment.<sup>22</sup>

**Work together to reduce future risks.** Local and regional impacts caused by natural hazards can affect multiple jurisdictions. The Federal Government and nonfederal partners should promote cooperation across jurisdictions, regions, levels of government, and organizations. Impacts felt locally often require action across political boundaries. The Federal Government and

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<sup>19</sup> Lifeline functions are essential to the operation of most critical infrastructure sectors. Lifeline functions include communications, energy, transportation, and water. Department of Homeland Security. See the 2013 National Infrastructure Protection Plan. <https://www.dhs.gov/sites/default/files/publications/national-infrastructure-protection-plan-2013-508.pdf>.

<sup>20</sup> The RRAP is a cooperative assessment of specific critical infrastructure within a designated geographic area and a regional analysis of the surrounding infrastructure to address a range of infrastructure resilience issues that could have regionally and nationally significant consequences. These voluntary, non-regulatory RRAP projects are led by the Department of Homeland Security and are selected each year by the Department with input and guidance from federal, state, and local partners. See <https://www.dhs.gov/cisa/regional-resiliency-assessment-program>.

<sup>21</sup> The THIRA helps communities understand their risks and determine the level of capability they need to address those risks. See <https://www.fema.gov/threat-and-hazard-identification-and-risk-assessment>.

<sup>22</sup> The Investment Strategy does not propose structural changes to existing federal programs, new federal requirements, or new federal legislation. Implementation actions may address opportunities for improvement to existing programs.

nonfederal partners will get the most out of cost-effective mitigation investments by working together.

For example, municipal infrastructure investments are locally funded, sometimes with support from federal or state programs. However, much of this infrastructure is owned and operated by the private sector. Revenue may come in from rates charged to consumers with regulatory approval.

In this example and others, the Federal Government should serve as a model for nonfederal partners by aligning federal financing and incentives with nonfederal sources. Aligning investments will reduce future risk to critical infrastructure and the lifelines this infrastructure supports.

**Improve and align incentives.** Many incentive programs have shown promising results, and can be better leveraged through alignment across the Federal Government and nonfederal partners (See [Recommendation 3.1](#)). Examples include:

- Federal grant programs with initial cost-sharing (See [Encourage Regional Collaboration: The Mouse River Flood Protection Project](#));
- Low-interest disaster repair loans and grants that fund mitigation or support buyouts and change land use to better mitigate in areas prone to flooding or wildfires;
- Federal, state, local, tribal, and territorial tax credits;
- Discounts on insurance premiums;
- Utility-financed investments to increase infrastructure resilience and support customer resilience (for example, distributed energy resources and microgrids);
- Grant programs to repair, strengthen, and buyout homes and strengthen communities; and
- Recognition programs that encourage more mitigation investments.

Other ways for the Federal Government and nonfederal partners to build upon current success include:

- Assessments that address long-term risks, prioritize risk-based investments, discourage risky behaviors, and appropriately recognize the risk;
- Incentives to build beyond minimum requirements (for example, hazard mitigation grant programs, community rating systems, Building Code Effectiveness Grading Schedule,<sup>23</sup> and FORTIFIED<sup>24</sup>) (See [Recommendation 3.1](#));

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<sup>23</sup> This program, which influences local fire and building codes, is used by the Insurance Service Office to evaluate how communities enforce their codes through plan reviews and field inspections. See [https://www.usfa.fema.gov/training/coffee\\_break/051518.html](https://www.usfa.fema.gov/training/coffee_break/051518.html).

<sup>24</sup> FORTIFIED Home™ is a set of engineering and building standards designed to help strengthen new and existing homes through system-specific building upgrades to minimum building code requirements that will reduce damage from specific natural hazards. See <https://disastersafety.org/fortified/>.



- Private-sector, state, local, tribal, and territorial incentives that reinforce federal incentives and encourage collaborative investment (for example, co-funded projects);
- Aligned programs and priorities. (for example, communities with robust resilience practices—like the adoption of model building codes—could receive favorable insurance ratings and community bonds); and
- Innovative financial products as incentives to improve resilience (for example, regional resilience trust funds, catastrophe bonds, and green bonds) (See [Recommendation 3.3](#)).

### **Encourage Regional Collaboration: The Mouse River Flood Protection Project**

Mitigation investment and incentives today mostly encourage small-scale household or community actions, but need to be used more broadly. These actions are important to national strategy. The nation also needs to encourage projects that reduce catastrophic risks on a regional scale.

One successful example is the Mouse River Flood Protection Project by the city of Minot, North Dakota. After devastating flooding in 2011 caused damages over \$690 million dollars, and the potential for additional damages from future floods, Minot planned a flood control and water management system to protect the city and nearby U.S. Air Force base. This nearly \$1 billion project needed more than one sponsor. A grant from the U.S. Department of Housing and Urban Development (HUD) National Disaster Resilience Competition allowed the city to get additional public and private support for projects. Additional support included the Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program, a 0.7 percent City of Minot sales tax, state funding through the North Dakota State Water Commission, and private business support.<sup>25</sup>

### **Recommendation 2.3 – Make Funding for Mitigation Investment Easier to Access**

At times, it is challenging for nonfederal partners to find existing sources to fund mitigation investment. Nonfederal partners have also had difficulty navigating supporting processes for mitigation investment. For example, during Hurricane Sandy, state and local officials reported numerous challenges with application requirements for natural disaster response, recovery, and mitigation funding.

Where possible, the Federal Government and nonfederal partners should simplify mitigation funding processes, coordinate co-funding, and encourage plan integration, while maintaining requirements and standards for effective mitigation.

<sup>25</sup> See <https://www.hudexchange.info/resources/documents/NDRC-Phase-2-NOFA.pdf>.

## Funding Mitigation with Competitions and Partnerships: National Disaster Resilience Competition and Floodplains by Design

When the Disaster Relief Appropriations Act appropriated \$16 billion for disasters in 2011, 2012, and 2013,<sup>26</sup> HUD made approximately \$1 billion available through the National Disaster Resilience Competition.<sup>27</sup> Interagency Federal panels reviewed the proposals. HUD selected 13 applicants from across the country.

To assist applicants and grantees, the Rockefeller Foundation engaged nearly 350 resilience experts. The foundation also hosted a series of “resilience academies.” The goal: help applicants create grant proposals that went beyond traditional resilience solutions to address social, economic, and environmental issues. Beyond the competition, applicants took valuable skills back to their communities.<sup>28</sup>

Washington State’s Floodplains by Design partnership is another powerful example of public-private collaboration. Floodplain management, particularly around Puget Sound, has not kept pace with growth. Homes and businesses are increasingly at risk of flooding. Water quality has declined, and the critical salmon habitat is disappearing.

The partnership addresses diverse goals for floodplain management and ecosystem recovery. Washington’s floodplains serve a range of community, economic, natural, and cultural needs. The partnership uses public and private funding to meet broad community resilience needs, protect from floods, restore habitats, improve water quality, and enhance outdoor recreation. Projects reduce flood risk while protecting and restoring habitat.<sup>29</sup>

**Simplify application processes.** Potential applicants need clear information on application for mitigation funding programs and who to reach out to for assistance. Nonfederal partners should provide input to the Federal Government for changes in new and existing application processes. As able, the Federal Government and nonfederal partners should streamline application processes and supporting paperwork into clear, simple steps. The Federal Government and nonfederal partners can also jointly review eligibility requirements. The goal is to make sure that processes supporting funding are easy to understand, consistent across similar programs, and accommodate local applicants.

**Supporting co-funding.** Co-funded programs make additional high-priority risk reduction projects possible. However, the Federal Government and nonfederal partners need to review and align their timing and sequence of funding sources. Public and private sector grants, loans, insurance payments, and special funds often have different timelines (for example, filing due dates, project timeframes, awards, and payments). Conflicts in funding timelines may prevent high-priority projects from being funded.

<sup>26</sup> Pub. L. 113–2, 122 Stat. 3585 (2013).

<sup>27</sup> HUD, *Community Planning and Development: National Resilience Disaster Recovery Phase Two* (June 2015), <https://portal.hud.gov/hudportal/documents/huddoc?id=2014ndrc2-nofa.pdf>.

<sup>28</sup> Rockefeller Foundation. “National Disaster Resilience Competition” (2019), <https://www.rockefellerfoundation.org/our-work/initiatives/national-disaster-resilience-competition/>.

<sup>29</sup> State of Washington. “Floodplains by Design” (2019), [www.floodplansbydesign.org](http://www.floodplansbydesign.org).

Co-funding expectations also should be communicated clearly and early. When mitigation projects involve multiple sources of funding (for example, cost-sharing or co-pays), applicants should have ample time to coordinate with each funding source.

**Encourage plan integration.** Hazard mitigation plans are required for certain categories of federal disaster assistance, but these plans are not always integrated into or aligned with other community plans (for example, comprehensive, economic development, recovery, or land use plans). When plans are not integrated, vulnerabilities may not be addressed, and investment dollars might not be used to their full potential.

The Federal Government and nonfederal partners should help by making plan integration a requirement for funding where possible, and by creating incentives for plan integration. In addition, the Federal Government should work with nonfederal partners to develop guidance on integrating mitigation plans into other existing plans and how to use existing community plans for mitigation purposes.

Improved plan integration benefits everyone. Plan integration increases awareness of mitigation opportunities and of funding possibilities. Plan integration helps organizations identify where mitigation will have the greatest community payoff while addressing multiple community needs. This reduces the likelihood of development in an area of elevated risk. Furthermore, plan integration also helps to ensure that risks are properly accounted for if such development happens.

### Supporting Integrated Planning in California

The Coastal Plan Alignment Compass (Compass) helps local governments in California coordinate local planning for coastal resilience. The Compass was developed by the National Oceanic and Atmospheric Administration (NOAA) Office for Coastal Management, U.S. Geological Survey (USGS), and FEMA along with the California Governor’s Office of Emergency Services, Governor’s Office of Planning and Research, California Coastal Commission, California Ocean Protection Council, and State Coastal Conservancy.

The Compass shows required elements and best practices for four types of plans: local coastal programs, local hazard mitigation plans, general plans, and climate action plans. With the Compass, local governments see when to use vulnerability assessments, match up similar opportunities, and view potential policy conflicts. The Compass also shows where tools and state guidance fit into the planning process. The Governor’s Office of Planning and Research worked together with NOAA and USGS to build an online version of the tool for the California’s Adaptation Clearinghouse, which is now available.<sup>30</sup>

<sup>30</sup> California Adaptation Warehouse. Coastal Plan Alignment Compass (2019). <https://resilientca.org/topics/plan-alignment/>.

## Goal 3: Make Mitigation Investment Standard Practice

Making mitigation standard practice in all aspects of business and infrastructure starts with clearly defined expectations, a commitment to shared standards, and educating and committing the Federal Government and nonfederal partners to uphold these standards.

Goal 3 calls for the whole community to consider mitigation in all investment decisions, especially for buildings and infrastructure. This includes adopting and enforcing up-to-date building codes, safeguarding lifelines and critical infrastructure, and using and expanding financial products and approaches that transfer and reduce risk. Financial products and approaches could include funding, incentives, and opportunities to transfer financial risk.

### Recommendation 3.1 – Encourage Communities to Adopt and Enforce Up-to-Date Building Codes

Building codes regulate the design, construction, and occupancy of buildings and structures by providing minimum requirements to safeguard public safety, health, and general welfare. Architects, engineers, builders, and regulators should use the latest building codes for the most up-to-date requirements for structural integrity, mechanical integrity, fire prevention, and energy conservation. Using up-to-date building codes helps communities survive, remain resilient, and continue to provide essential services after a disaster occurs.

After disasters, rebuilding structures to up-to-date building codes reduces risk. Using and enforcing building codes over time reduces losses. According to a 2018 study by the NIBS, designing buildings to meet the 2018 International Residential Code (IRC) and 2018 International Building Code (IBC)—versus the prior generation of codes represented by 1990-era design and National Flood Insurance Program (NFIP) requirements—yields a national benefit of \$11 for every \$1 invested.<sup>31</sup>

Keeping building codes, specifications, and standards up to date is important. Over time, updates improve the quality of buildings and makes communities more resilient. The IBC and the IRC provide the minimum criteria for buildings and infrastructure. The IBC and IRC are updated on a three-year cycle based on the latest science and consensus from the Federal Government and nonfederal partners. A growing number of states and communities have adopted building codes and standards set to higher performance requirements. Nearly all 50 states—or jurisdictions within those states—have adopted a version of the IBC and IRC.

However, code development and enforcement vary widely across the country. It is the role of states and communities to adopt (or not adopt) codes for natural hazard resistance. Developing, approving, incorporating, inspecting, and enforcing building codes varies widely across the

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<sup>31</sup> NIBS. “Natural Hazard Mitigation Saves: 2018 Interim Report” (January 2019), <https://www.nibs.org/page/mitigationsaves>.

country, and only 32 percent of disaster-prone jurisdictions have adopted disaster-resistant building codes.<sup>32</sup>

The Federal Government and nonfederal partners should commit to supporting the development, use and enforcement of meaningful, up-to-date building codes, specifications, and standards.

**Empower advocates and communicate expectations of protection.** Public demand often leads to updated codes and practices. Greater accountability often leads to stronger enforcement. The Federal Government and nonfederal partners may encourage both by:

- Developing resources and publications to inform the people and organizations that administer and enforce building codes;
- Supporting efforts that educate communities about the value of improving codes and practices and create demand at the community and individual level, such as the Federal Alliance for Safe Homes or the Institute for Business and Home Safety; and
- Taking actions that lead to updated state and local codes and practices.

**Partner for expertise.** After disasters, buildings must be quickly inspected for safe occupancy and rebuilt to code. Communities should use mutual aid programs, like the Emergency Management Assistance Compact, to have trained, certified professionals handle building inspections and code administration.

**Use financial incentives.** Less damage after a catastrophe and lower insurance premiums are strong incentives for using and enforcing building codes.<sup>33</sup> The Federal Government and nonfederal partners should also consider other financial incentives. For example, Small Business Administration borrowers approved for physical disaster loans may receive additional funds for mitigation measures. Connecting codes to funding may promote more widespread resiliency efforts (See [Recommendation 2.2](#)).

For example, the Insurance Institute for Business and Home Safety (IBHS) developed building standards criteria, supporting guides, and a third-party validation process that are designed to make homes more resistant to natural hazards. IBHS building standards criteria exceed the minimum life-safety requirements of local building codes. IBHS guides show how to retrofit homes for greater hurricane resistance. Several states, including Alabama, Mississippi, Georgia, and North Carolina, have mandated insurance incentives for meeting IBHS criteria. Mississippi passed legislation that requires Mississippi-admitted insurance companies to provide discounts to homeowners in specified coastal counties for houses that receive an IBHS FORTIFIED Home designation.<sup>34</sup>

<sup>32</sup> Data developed by FEMA’s Building Science Branch (April 2019), based on adoption of the 2015 IBC and IRC as the minimum disaster-resistant codes.

<sup>33</sup> Insurance Services Office, Inc. National Building Code Assessment Report (2019),

<https://www.verisk.com/siteassets/media/downloads/underwriting/location/2019-bcegs-schedule.pdf>

<sup>34</sup> IBHS. “Regulatory Framework for FORTIFIED Insurance Incentives,” [http://disastersafety.org/wp-content/uploads/FORTIFIED-Home-Incentives\\_IBHS.pdf](http://disastersafety.org/wp-content/uploads/FORTIFIED-Home-Incentives_IBHS.pdf).

Also, in 2005, the Florida legislature passed a law requiring all residential property insurance companies to file premium discounts with the State’s Office of Insurance Regulation for customers who live in homes built with certain construction types or with certain mitigation devices (for example, shutters).<sup>35</sup>

**Include codes and accountability in grants and laws.** Up-to-date building codes and standard criteria should be required in federal and state grants and programs. For example, FEMA has conditional requirements for Hazard Mitigation Assistance. The NFIP has minimum building standards for development in special flood hazard areas that predate modern up-to-date building codes and standards.<sup>36</sup> The DRRA calls for FEMA’s grant programs to require the latest building codes and standards.<sup>37</sup>

Additionally, DRRA proposes legal changes that would reward state investments in resilient building and mitigation through actions such as increasing cost shares and linking assistance to other financial incentives to mitigate.

### Recommendation 3.2 – Strengthen Critical Infrastructure and Lifelines

Lifelines are the critical services essential to human health, public safety, and economic security. Hazard mitigation reduces the risk that these services will be disrupted by an incident. Hazard mitigation also reduces the time and effort needed to get services back up and running.

**Protect connected systems with defined standards.** Critical infrastructure, systems, and networks are complex and interdependent. Roles and responsibilities cross jurisdictional boundaries. For example, business and infrastructure owners and operators take primary responsibility for managing systems during emergencies. These connections and dependencies make critical infrastructure vulnerable to cascading failures.

To reduce risks to critical infrastructure, the Federal Government and nonfederal partners need to coordinate how risks are prioritized by evaluating principal risk factors and the costs and benefits of mitigation investments. Additionally, the Federal Government should help nonfederal partners understand national priorities for lifeline sustainment and alignment of priorities to support lifelines. When possible, the Federal Government and nonfederal partners should also provide technical assistance to help assess critical infrastructure systems, evaluate risks and dependencies, and find opportunities for mitigation investment and planning.

<sup>35</sup> State of Florida Office of Insurance Regulation. “Premium Discounts for Hurricane Loss Mitigation”. <https://www.floir.com/Sections/PandC/HurricaneLossMitigation.aspx>.

<sup>36</sup> U.S. Congressional Budget Office. “Expected Costs of Damage from Hurricane Winds and Storm-Related Flooding” April 10, 2019. <https://www.cbo.gov/publication/55019>.

<sup>37</sup> On October 5, 2018, the President signed the DRRA of 2018 into law as part of the Federal Aviation Administration Reauthorization Act of 2018. These reforms acknowledge the shared responsibility of disaster response and recovery and aim to build the nation’s capacity for the next catastrophic event. Disaster Recovery Reform Act of 2018, in FAA Reauthorization Act of 2018 (Division D), (2018), <https://www.congress.gov/bill/115th-congress/house-bill/302/text?q=%7B%22search%22%3A%5B%22302%22%5D%7D&r=17#toc-H0BEFB0D1F18A4FCE8DF98CB781393ABE>.

**Mitigate throughout the disaster lifecycle.** The DRRA also aims to build the nation’s capacity for the next catastrophic event. Section 1234 of the DRRA, National Public Infrastructure Pre-Disaster Hazard Mitigation, authorizes the National Public Infrastructure Pre-Disaster Mitigation Fund for mitigation investment and planning prior to disasters, which will be funded through the Disaster Relief Fund as a six percent set aside from estimated disaster grant expenditures. Examples of mitigation investment and planning efforts that may use this fund include: prioritizing infrastructure, setting response and recovery requirements, and partnering on exercises to determine lifeline vulnerabilities in need of mitigation.

After a declared disaster, the Federal Government should consider and use opportunities to leverage mitigation plans and coordinate efforts with nonfederal partners, such as: prioritizing implementation of mitigation actions, incorporating mitigation measures into rebuilding efforts, and using lessons learned to update mitigation plans.

**Link research and development to improved practice.** Natural disaster planning and recovery is a good time to assess critical infrastructure systems for risk and mitigation opportunities. The Federal Government should support nonfederal partners by providing guidance, useable tools, and resources.

Mitigation projects for critical infrastructure should account for evolving design needs. The Federal Government and nonfederal partners should continue to support research and development in critical infrastructure security and resilience (for example, infrastructure design standards for protection from natural and human-caused incidents).

### Realizing the Value of Proactive Mitigation

Electric cooperatives are using mitigation investments to reduce infrastructure damage and keep customers online during and after natural disasters. According to the National Rural Electric Cooperative Association, electric cooperatives historically have had limited funding for improvements. Rural areas tend to have higher electric rates than urban areas, and many regions have high poverty rates. As a result, many mitigation activities only take place during disaster recovery, and post-disaster funding rarely covers all losses. However, electric cooperatives are quickly beginning to recognize the cost effectiveness of upgrading infrastructure before, rather than after, natural disasters.

In 2013, Alfalfa Electric Cooperative in Oklahoma lost over 700 electric poles in a historic ice storm. The cooperative rebuilt the entire impacted electric system with higher rated poles, designed to withstand greater physical loads. The same electric system withstood two subsequent severe ice storms with no major pole damage. Successful mitigation investments like these have encouraged cooperatives to research and develop mitigation technology and alternative materials (for example, building materials, conductors, insulators). Cooperatives have also researched alternate electric infrastructure designs, such as microgrids to mitigate damage.<sup>38</sup>

<sup>38</sup> Drawn from letter correspondence from NRECA to FEMA capturing feedback for the National Mitigation Investment Strategy Version 0.5, dated March 9, 2018. Filed electronically via [fema-nmis@fema.dhs.gov](mailto:fema-nmis@fema.dhs.gov).

### Recommendation 3.3 – Use and Expand Financial Products and Approaches to Reduce and Transfer Risk

Communities traditionally reduce or transfer financial risks from natural hazards through public sector programs, such as Federal government grants and loans, state and local fees (for example, storm water fees), and national insurance. However, there are new and expanded public and market-based financial products and funding approaches available that can better support distributing the cost of mitigation across, both, the Federal Government and nonfederal partners.

Examples of new financial products and approaches include increasing the use of state and local tax credits for mitigation investment and catastrophe and resilience bonds. Hazard insurance programs, such as the NFIP, contribute to reducing risks by accelerating the recovery process after a disaster. Additionally, insurance providers continue to explore ways to reward policy holders who take risk mitigation actions by offering reduced premiums, lower deductibles, and other incentives. The Federal Government and nonfederal partners should help communities continue to test and select the most appropriate products and approaches to promote risk reduction.

**Consider new options to transfer or share risk.** Environmental impact bonds, pay-for-performance models, and insurance-linked securities reduce risk and deliver returns for investors.

For example, risk transfer occurred after Superstorm Sandy when New York City’s Metropolitan Transportation Authority issued \$200 million of catastrophe bonds. Catastrophe bonds transferred catastrophic risk from New York City’s Metropolitan Transportation Authority to the capital markets<sup>39</sup> and provided additional financial protection against storm surge.

Catastrophe bonds have also transferred risk for earthquakes<sup>40</sup> and wind.<sup>41</sup> The Federal Government and nonfederal partners should consider the costs and benefits of all available financial products to transfer and reduce risk, and promote leading practices in their use.

**Encourage and reward mitigation investment.** Hazard insurance, which traditionally is used to transfer financial risk, can also encourage risk reduction by including incentives. Incentives encourage people in hazard-prone areas to purchase insurance. Examples include premium reductions, lower deductibles, and higher coverage limits (See [Recommendation 3.1](#)). However, sometimes incentive programs only benefit individuals and communities. Also, programs may not always help lower the overall risk profile for the state, or deliver the most effective return on

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<sup>39</sup> Federal Insurance Office, U.S. Department of the Treasury, *The Breadth and Scope of the Global Reinsurance Market and the Critical Role Such Market Plays in Supporting Insurance in the United States*, at p. 39 (December 2014),

<https://www.treasury.gov/initiatives/fio/reports-and-notice/Documents/FIO%20-Reinsurance%20Report.pdf> (defining catastrophe bonds and other alternative reinsurance instruments).

<sup>40</sup> Artemis, *Catastrophe Bond and Insurance-Linked Securities Deal Directory: Embarcadero Re Ltd. (Series 2012-2)*, [http://www.artemis.bm/deal\\_directory/embarcadero-re-ltd-series-2012-2/](http://www.artemis.bm/deal_directory/embarcadero-re-ltd-series-2012-2/).

<sup>41</sup> Artemis, *Catastrophe Bond and Insurance-Linked Securities Deal Directory: Calypso Capital II Ltd. (Series 2013-1)*, [http://www.artemis.bm/deal\\_directory/calypso-capital-ii-ltd-series-2013-1/](http://www.artemis.bm/deal_directory/calypso-capital-ii-ltd-series-2013-1/).



mitigation investment. Where appropriate, the Federal Government and nonfederal partners should identify and use successful incentive programs that align with resilience goals. Partners should also test new strategies for insurance incentives. Effectiveness of programs across the whole community is important.

## Next Steps

### Investment Strategy Implementation Scope

The Investment Strategy drives solutions that do not need structural changes to existing federal programs, new federal requirements, or new federal legislation. The MitFLG may consider actions outside of the identified scope of the Investment Strategy; for example, encouraging public-sector entities to work together to improve access to mitigation resources.

The MitFLG will address the impact to the Investment Strategy of new statutory authorities, like the DRRA,<sup>42</sup> as they are implemented by respective Federal agencies. For example, the DRRA:

- Establishes over 50 new authorities across FEMA;
- Creates a larger, more consistent stream of funding for the FEMA BRIC program; and
- Clarifies Federal reimbursement for some nonfederal government expenses for rebuilding after a natural disaster.

### Investment Strategy Implementation

The MitFLG will coordinate the Investment Strategy implementation, carried out by the whole community. Implementation of the Investment Strategy recommendations will transform how the whole community:

- Thinks about, values, and invests in mitigation;
- Coordinates resources for high-priority risk reduction;
- Creates incentives (and removes disincentives) to invest in mitigation;
- Protects investments in buildings and infrastructure with new technical and financial products, including financial products that incentivize risk reduction; and
- Considers mitigation in all investment decisions (especially for buildings and infrastructure).

Starting in Fiscal Year 2020 the MitFLG will bring the Federal Government and nonfederal partners together to implement Investment Strategy recommendations, an effort led by a MitFLG-developed Implementation Team. The Implementation Team will support annual

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<sup>42</sup> FAA Reauthorization Act of 2018, Pub. L. 115-254, 132 Stat. 3186, Division D (Sec. 1201-1246), Disaster Recovery Reform Act of 2018, (Oct. 5, 2018).

initiatives to increase implementation awareness and participation, coordinate tools and resources, improve incentives, and encourage innovation. MitFLG-coordinated implementation efforts do not preclude a broader effort by the whole community. MitFLG coordination will include an annual priority-setting process for implementation actions, and an interagency review process for proposed implementation projects. The MitFLG will periodically evaluate the success of implementation efforts by the whole community.

## Conclusion

Risks from natural hazards are growing. So are the effects of natural disasters on lifelines, businesses, infrastructure, and natural, cultural, and historic resources. While critical, mitigation investment in this unpredictable, ever-changing environment is challenged by limited resources and competing priorities for protecting lives, property, and communities.

This Investment Strategy is a vision and commitment to safeguard the whole community from natural hazards. With ambitious but achievable goals, the Investment Strategy aims to more effectively and efficiently leverage and coordinate mitigation investments. Success requires maximum participation from the whole community and consistent collaboration between the Federal Government and its vital nonfederal partners.

The recommendations, once implemented, will reduce loss of life and injuries, damage to property, and negative effects on the economy and the environment. The recommendations will lead the whole community to a more resilient future.

## Appendix A: Acronyms and Reference List

### Acronym List

BRIC	Building Resilient Infrastructure and Communities
DRRA	Disaster Recovery Reform Act
FEMA	Federal Emergency Management Agency
GAO	U.S. Government Accountability Office
HUD	U.S. Department of Housing and Urban Development
IBC	International Building Code
IBHS	Insurance Institute for Business Home Safety
IRC	International Residential Code
LEED	Leadership in Energy and Environmental Design
MitFLG	Mitigation Framework Leadership Group
NFIP	National Flood Insurance Program
NIBS	National Institute of Building Science
NMIS	National Mitigation Investment Strategy
NOAA	National Oceanic and Atmospheric Administration
RRAP	Regional Resiliency Assessment Program
SLTT	State, Local, Tribal, and Territorial
THIRA	Threat and Hazard Identification Risk Assessment
USGS	U.S. Geological Survey

References

Department of Homeland Security Risk Lexicon, 2010 Edition. September 2010.

National Infrastructure Protection Plan (NIPP) 2013: Partnering for Critical Infrastructure Security and Resilience. June 6, 2013.

National Preparedness Goal, Second Edition. September 2015.

Presidential Policy Directive (PPD)-8, National Preparedness. March 30, 2011.

Presidential Policy Directive (PPD)-21, Critical Infrastructure Security and Resilience. February 12, 2013.

S.3041 – 115<sup>th</sup> Congress: Disaster Recovery Reform Act of 2018. March 11, 2019.

## Appendix B: Glossary of Terms

**Access and Functional Needs.** Individuals who may have additional needs before, during, and after an incident. These needs include but are not limited to health, independence, communication, transportation, support, services, self-determination, and medical care.

Individuals in need of additional response assistance may include those who:

- Have disabilities;
- Live in institutionalized settings;
- Are older adults or children;
- Are from diverse cultures;
- Have limited English proficiency or are non-English speaking; or
- Are transportation-disadvantaged.

**Critical Infrastructure.** Systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters.

**Incident.** Occurrence, caused by either human action or natural phenomena, that may cause harm and that may require action.

**Mitigation.** The capabilities necessary to reduce loss of life and property by lessening the impact of disasters. Used interchangeably with *hazard mitigation*.

Note: This definition is the Interagency-developed definition provided in PPD-8, *National Preparedness*. This Investment Strategy focuses on mitigation to lessen the impact of disasters caused by natural hazards (See [Scope](#)).

**Natural Hazards.** Source of harm or difficulty created by a meteorological, environmental, or geological phenomenon or combination of phenomena.

**Resilience.** The ability to prepare for anticipated hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions.

Note: This definition is adapted from the definition of resilience provided in PPD-21. This Investment Strategy focuses on resilience for withstanding and rapidly recovering from natural hazards (See [Scope](#)).

**Whole Community.** A focus on enabling the participation in national preparedness activities of a wider range of players from the private and nonprofit sectors, including nongovernmental organizations and the general public, in conjunction with the participation of all levels of government in order to foster better coordination and working relationships.

## Appendix C: Strategy Development

### GAO Conditions of Satisfaction Checklist

The GAO encouraged the MitFLG to establish “an investment strategy to identify, prioritize, and implement Federal investment disaster resilience.”<sup>43</sup> The GAO outlined five conditions for this Investment Strategy:

- (1) The Investment Strategy should show the need to prioritize federally funded efforts. How do efforts contribute to overall risk reduction? The strategy must also show that methodologies are needed for setting priorities.
- (2) The Investment Strategy’s goals should align with tools in the Federal toolbox and lead to a meaningful approach to identifying and reducing national risks.
- (3) The Investment Strategy’s goals should emphasize risk-based decisions, avoidance of potential losses, and cost-benefit analyses of investment alternatives.
- (4) The Investment Strategy should encourage incentives and practices that ultimately achieve an appropriate balance between Federal and nonfederal investments.
- (5) The Investment Strategy does not need to advocate specific policy approaches, but the strategy should identify structural (including statutory) challenges to aligned incentives.

### Strategy Development and Stakeholder Engagement

The MitFLG tapped its members’ expertise to create a draft National Mitigation Investment Strategy (“Draft Investment Strategy,” also known as “Version 0.5”). Released in January 2018, the Draft Strategy was designed to encourage thought, discussion, and feedback from the whole community.<sup>44</sup>

**Fundamental Principles.** The Draft Investment Strategy had three fundamental principles:

- (1) Encourage mitigation investments and innovation in the private and non-profit sectors.
- (2) Improve collaboration between the Federal Government and SLTT governments and respect local expertise.
- (3) Make decisions using data (including lifetime costs) and accounting for risks.

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<sup>43</sup> See GAO, *Report to Congressional Requestors: Hurricane Sandy – An Investment Strategy Could Help the Federal Government Enhance National Resilience for Future Disasters*, No. GAO-15-515 (July 2015) (GAO Hurricane Sandy Report), <https://gao.gov/assets/680/671796.pdf>.

<sup>44</sup> See, for example, “National Mitigation Framework: National Mitigation Investment Strategy,” FEMA (May 8, 2018), <https://www.fema.gov/national-mitigation-framework>; “New Draft National Mitigation Investment Strategy for Public Comment,” FEMA, (August 5, 2018). <https://www.fema.gov/media-library/assets/documents/116787>.

**Recommendations and Outcomes.** The Draft Investment Strategy aimed to achieve the following:

- Federal, public, private sector, and non-profit entities improve their coordination of risk mitigation and management;
- Private sector and non-profit entities increase their mitigation investment and innovation;
- SLTT governments lead more risk reduction activities and share responsibility and accountability with the Federal Government;
- Public, private-sector, and non-profit entities develop and share more data and tools for more informed investment decisions;
- More effective communication of risks by public, private sector, and non-profit entities leads to more mitigation investments by individuals and communities; and
- The built environment (for example, grey or nature-based infrastructure, buildings, homes) becomes more resilient and promotes community resilience.



Figure 2. Draft Strategy Outcomes

**Recommendations Criteria.** All 22 recommendations satisfied the following criteria:

- **Actionable.** A recommendation must be feasible and detailed enough to be actionable.
- **Targeted.** A recommendation should not be so high-level that one could reasonably argue that the recommendation is already satisfied. The recommendation should not be so narrowly focused that it applies to only one agency or project.
- **Clear Benefits.** The recommendation must show a return on investment (for example, reducing overall loss, catalyzing more mitigation investments), meet other public policy goals, or provide other benefits.
- **Trackable.** The MitFLG or some other body must be able to see if a recommendation has been implemented, track progress, and measure the recommendation's effect on the whole community.

- **Within Existing Authorities.** A recommendation must not require federal or state legislative action. The recommendation must work within the existing legal authorities of Federal and SLTT departments and agencies. However, a recommendation could be implemented with Federal or SLTT rules or guidance.

Drafters of the Draft Investment Strategy used the following prioritization criteria, presented in no specific order. A recommendation did not need to meet all criteria.

- **Coordinated Funding.** A recommendation should coordinate funding across the Federal Government and nonfederal partners.
- **Supported by Research.** A recommendation should not require additional research or the development of more data.
- **No New Appropriations.** A recommendation should not require new funding from Congress.
- **Favoring Multi-Hazard.** A recommendation should apply across multiple hazards where possible.
- **Favoring Multi-Sector.** A recommendation should apply across multiple regions and economic sectors where possible.
- **Proactivity.** A recommendation should encourage proactive, pre-disaster investments. The recommendation should help communities prepare for, rather than respond to and recover from, natural hazards.
- **Risk-Informed Decision Making.** A recommendation should encourage risk-informed decisions. The recommendation should be supported by commonly understood, science-based estimates and scenarios.
- **Leading Practices.** A recommendation should encourage compliance with leading practices (for example, standards for risk management).
- **Vulnerable Population.** A recommendation should support investments that decrease social and economic vulnerability along with vulnerability to natural hazards. A recommendation should encourage projects that benefit socially and economically vulnerable populations.
- **Public-Private Partnerships.** A recommendation should encourage public-private partnerships.



**Stakeholder Engagement.** The MitFLG invited public comment on the Draft Investment Strategy from January 11, 2018 to March 11, 2018. Over 750 comments represented a broad range of perspectives.<sup>45</sup>

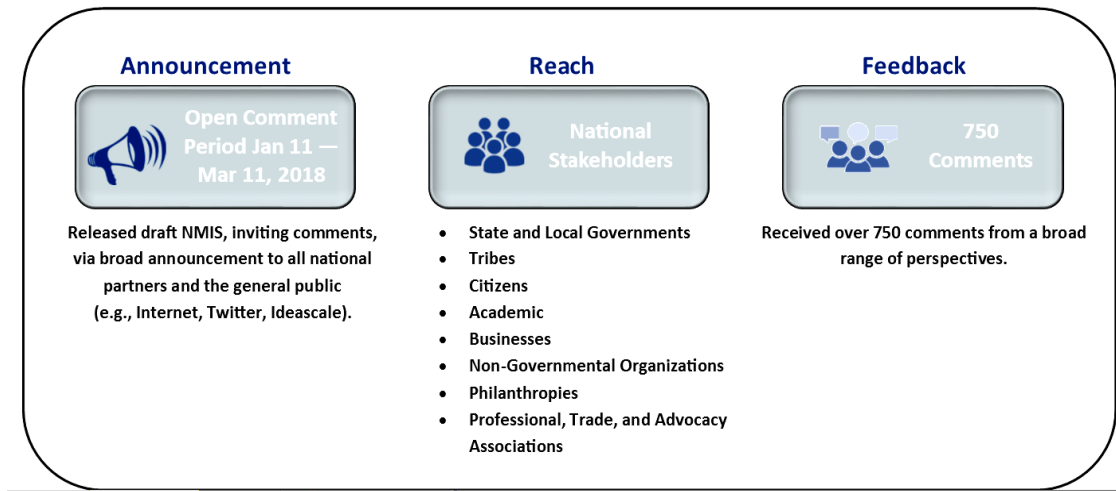


Figure 3. Stakeholder Engagement

Stakeholder feedback led the MitFLG to condense and simplify the Investment Strategy. The MitFLG reduced the original six goals to three and original 22 recommendations to nine.

<sup>45</sup> Draft National Mitigation Investment Strategy: Highlights from Stakeholder Engagement: January 11 – March 11, 2018 – Mitigation Framework Leadership Group (MitFLG), [https://www.fema.gov/media-library-data/1526408828264-3b45fdb7350040ac86b0187f26849ea/NMIS-Comms-Draft\\_20180427\\_508\\_Compliance.pdf](https://www.fema.gov/media-library-data/1526408828264-3b45fdb7350040ac86b0187f26849ea/NMIS-Comms-Draft_20180427_508_Compliance.pdf).